

## **Title: Beary Good Pattern Skills**

### **Brief Overview:**

This unit uses the story of Goldilocks and the Three Bears as a springboard to teach the students to copy, extend, describe, and create patterns. Students will use patterns in various ways to demonstrate their understanding of these concepts. The students will demonstrate mastery of pattern skills in cooperative learning groups and also will use patterns to solve contrived problems.

### **Links to NCTM Standards:**

- **Mathematics as Problem Solving**  
The students will show that they can solve simple problems using their knowledge of patterns and mathematical thinking.
- **Mathematics as Communication**  
The students will demonstrate the ability to describe patterns and predict what will come next. They will be able to compare and contrast pattern attributes in mathematical terms. They will communicate effectively with their cooperative learning peers.
- **Mathematics as Reasoning**  
Students will show the ability to reason mathematically and use models, facts, properties, and relationships within patterns to analyze and solve problems.
- **Mathematical Connections**  
The student will identify the core of a pattern and be able to repeat it. They also will be able to identify and recognize shapes, colors, symbols, and sizes, as well as orientation and direction.
- **Number Sense and Numeration**  
The students will show an understanding of one-to-one correspondence and sequencing.
- **Geometry and Spatial Sense**  
The students will be able to recognize and identify shapes. They also will demonstrate an awareness of an objects orientation and directionality.
- **Patterns and Relationships**  
The student will be able to recognize patterns and describe them. They also will show the ability to create similar patterns using different objects, pictures, and symbols.

**Grade/Level:**

Kindergarten through Grade 2

**Duration/Length:**

5 class sessions (variable)

**Prerequisite Knowledge:**

Students should have working knowledge of the following skills:

- Shape and color recognition
- Counting skills through 10
- Using manipulatives
- Working in cooperative groups
- Using simple graphic organizers

**Objectives:**

Students will:

- work in cooperative groups.
- identify patterns.
- copy patterns.
- extend patterns.
- describe patterns.
- create patterns.
- use different mediums and symbols to create similar patterns.

**Materials/Resources:**

- Counting bears
- Goldilocks and the Three Bears
- Pattern Blocks
- Plastic spoons and bowls in various colors
- Unifix Cubes
- Chalkboard or overhead projector
- Sentence strips or adding machine tape
- Teacher resource sheets
- Overhead projector

## Development/Procedures:

### Activity 1:

- **Identifying a Pattern**

Read the story of Goldilocks and the Three Bears. The idea behind this is to expose the pattern of the papa bear first, the mama bear second, and the baby bear, following the mama bear. As Goldilocks encounters each bear's belongings,, set a counting bear out to represent each bear. For example, when Goldilocks eats Papa Bear's porridge set out a large, blue counting bear. When it is Mama Bear's porridge set out a red, medium counting bear. For the Baby Bear use a small yellow counting bear. A pattern will emerge. Large, Blue - Medium, Red - Small, Yellow....

- **Describing a Pattern**

At this point it is critical to discuss the attributes of this pattern with the students. Show them that the pattern repeats itself in both size and color. Use the term "the pattern repeats itself" to demonstrate appropriate mathematical language.

- **Extending a Pattern**

Ask the students what type of bear will come next in the pattern. Ask them to collectively continue the pattern. End the lesson with further discussion of the pattern's attributes. Discuss the repeating size and color. Point out that this is an ABC pattern. Three items repeat themselves again and again. Older students could make their own ABC pattern.

### Activity 2:

- **Identifying a Pattern**

Revisit the story of Goldilocks and the Three Bears. Ask the students what the pattern was that they uncovered in the previous lesson. Remind them of the appropriate terminology. Next, point out that there are patterns everywhere. For instance, pay attention to the part of the story when Goldilocks is eating the porridge. She encounters a spoon and a bowl, another spoon and a bowl, and then yet another spoon and bowl.

- **Copying a Pattern**

Divide the students into small cooperative groups (2 or 4 students) and provide them with plastic bowls and spoons. If possible use bowls and spoons of different colors. This will give the students the opportunity to experiment with color in the pattern as well as the items. Ask them to set the table for lunch with the three bears. They should set out three repeating sets of a spoon and a bowl.

- **Describing a Pattern**

Ask the students, "Is this a pattern?" Ask them to compare it to the first pattern. "Is it a pattern of three items repeating?" Then ask them to compare and contrast the two patterns. Use Teacher Resource Sheet #1 to set up a Venn diagram.

- **Extending a Pattern**

Present the students with Student Resource Sheet #1. Ask the students what they would do if the bears had guests over for lunch. They would need more place settings.

Ask the student to “extend the pattern.” They should continue to work in groups to do this. Older students can be divided into groups of 3. Each student is assigned a role as a bear. Give each student 2 feet of adding machine tape. Students are to make a pattern on the adding machine tape. Then, Papa Bear will put his pattern tape on his waist, representing that he is Papa Bear. Mama Bear will put hers on her head as a hat or head band. Baby Bear will put his over his shoulders as suspenders. When done, they can present their patterns to the class and call on students to identify the patterns and which character they are representing in the story.

### **Activity 3:**

Use Teacher Resource Sheet #2 as an overhead or recreate it on a chalkboard.

- **Identifying a Pattern**

Ask the students if item one is a pattern.

- **Describing a Pattern**

Ask the students to describe the pattern. Encourage the appropriate use of mathematical terminology. Point out that this is an ABAB pattern and that two items repeat themselves to form the pattern.

- **Extending a Pattern**

Ask the students “What will come next in this pattern?” Repeat this for item two. Point out that this is a ABC pattern and that three items repeat themselves to form the pattern.

Now give the class the Student Resource Sheet #2. Have them work in pairs to identify the patterns, describe the patterns to each other, and extend the patterns.

### **Activity 4:**

Divide the students into cooperative learning pairs. Supply each pair with various types of manipulatives, including unifix cubes. Counting bears are a good suggestion, but anything with different sizes or color will work (e.g., paper clips, poker chips).

- **Copying a Pattern**

Make an AB pattern in the front of the class with unifix cubes and ask the students to copy the same pattern on their desks with their unifix cubes.

- **Using different manipulatives and symbols**

Demonstrate how you can copy the same pattern using different manipulatives. Use another manipulative to create an AB pattern under the previous one. Ask the student to copy it also. Ask the students to describe the patterns and decide how they are alike and how they are different. Present the class with another pattern (ABC). Ask them to copy it using different manipulatives.

- **Creating a Pattern**

Challenge one member of each pair to create their own pattern. Ask them to describe it. Challenge the other member of the pair to copy it using a different manipulative. Ask them to describe their pattern. Switch roles and repeat the exercise.

**Activity 5:**

Provide each student with manipulatives and Student Resource Sheet #3.

- **Using different manipulatives and symbols**

Create a pattern (AB) on an overhead. Ask the students to copy it with their own manipulatives. Demonstrate on the overhead how the letters A and B can form a pattern just like the manipulatives can. Use Teacher Resource Sheet #3.

Next, demonstrate with another pattern (ABC).

Instruct the students to complete Student Resource Sheet #3.

**Performance Assessment:**

This unit includes three student worksheets that the teacher can use to assess how well the students are doing in comparison to each other. You will find additional rubrics in Teacher Resource Sheets #4, #5, and #6. Use these to assess your students' understanding and progress on the intended outcomes of this unit. Students can design their own pattern core and have a neighbor finish the pattern. This can be done with colored cubes or on paper. Then it can be checked by the person who made the core pattern.

**Extension/Follow Up:**

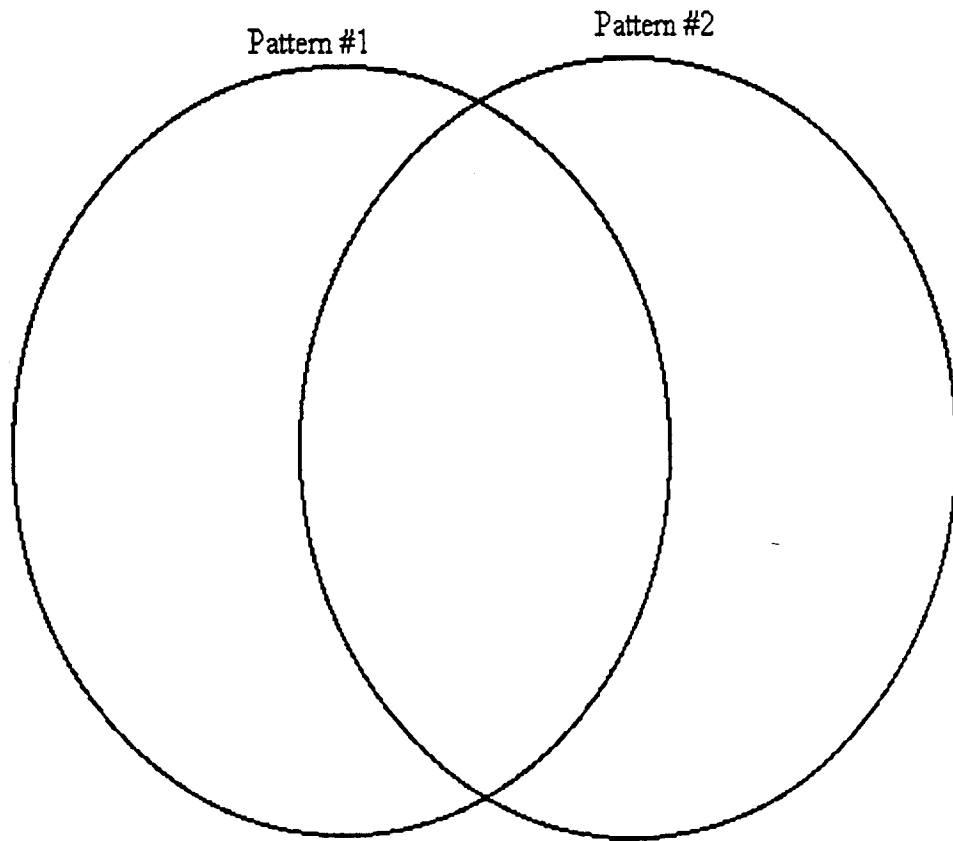
It is always important to allow the students time to explore with the manipulatives. They will come up with their own creative patterns. You may also want to include some challenging patterns that involve more than three terms in the core or that involve both color and shape in the core. A really good idea is to have the students design a quilt. Encourage them to make it as detailed as possible. Students can color tessellations making sure there are patterns. In addition, they can design a place mat. Students can design a pattern to go around their desk or name tag.

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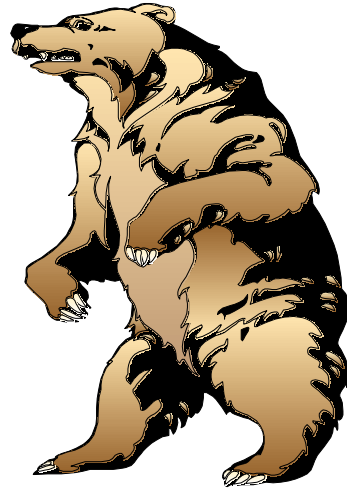
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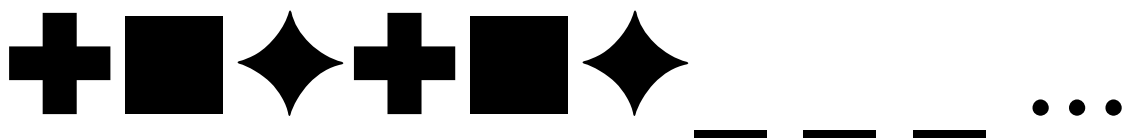
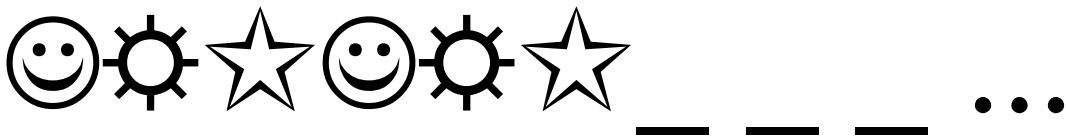
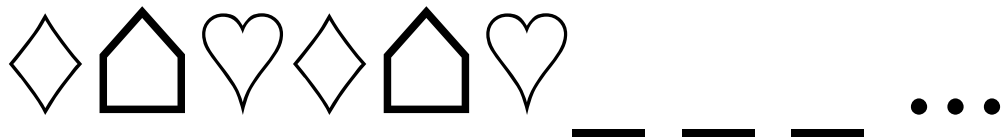
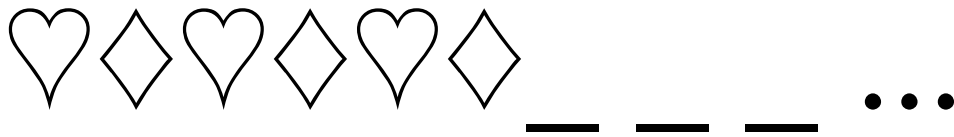
Teacher Resource #1  
Venn Diagram



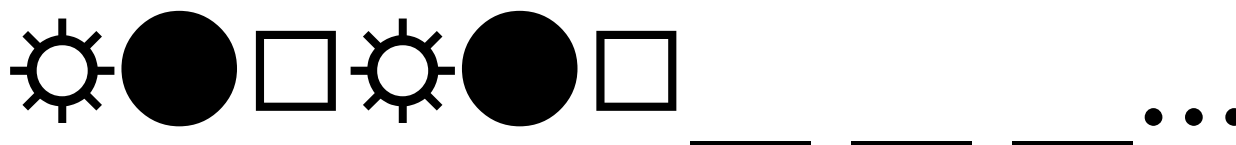
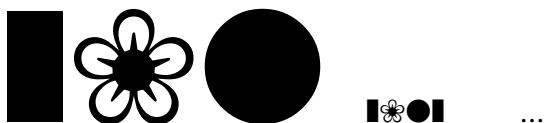
Vignette

The Three bears are having two guests for lunch. How will they set the table? Draw the spoons and bowls on the table.









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**Self Report on Pattern Skills**

- |  |   |   |
|--|---|---|
| 1. I can name the shapes and colors.                         |    |    |
| 2. I can see the pattern.                                    |    |    |
| 3. I can say the pattern.                                    |    |    |
| 4. I can keep doing the pattern.                             |    |    |
| 5. I can make my own pattern.                                |  |  |
| 6. I can make the same pattern out of many different things. |  |  |

Rubric for Pattern Skills

- 3 Uses appropriate mathematical language when describing a pattern.  
Identifies patterns in natural and contrived settings.  
Creates a pattern independently.  
Extends a pattern indefinitely.  
Copies a pattern accurately using a variety of manipulatives.
- 2 Uses some appropriate mathematical vocabulary when describing a pattern.  
Identifies patterns in contrived settings only.  
Creates a pattern when independently.  
Extends a pattern indefinitely.  
Copies a pattern accurately with many different manipulatives with assistance.
- 1 Uses little appropriate mathematical vocabulary when describing a pattern.  
Identifies patterns in contrived settings only.  
Creates a pattern with assistance.  
Extends a pattern, but does not show an understanding that it continues.  
Copies a pattern accurately using only identical manipulatives.
- 0 Does not use appropriate mathematical vocabulary when describing a pattern.  
Does not identify patterns in any setting.  
Does not create patterns.  
Does not extend patterns.  
Does not copy a pattern.

Teacher Resource Sheet # 6

Score	Identify	Describe	Copy	Create
3	Identifies the pattern correctly.	Correctly describes the pattern using appropriate math language.	Copies the pattern accurately.	Makes another correct pattern independently.
2	Identifies the pattern correctly.	Correctly describes the pattern using some math language.	Copies the pattern with few mistakes.	Makes another correct pattern with assistance.
1	Identifies the pattern incorrectly.	Vaguely describes the pattern using no math language.	Copies the pattern inaccurately and did not copy the pattern.	Makes an incorrect pattern
0	Does not identify the pattern correctly.	Can not describe the pattern correctly.	Did not copy the pattern and did not copy the pattern accurately.	Did not create a pattern.